Don’t Go With The Flow!
Control and Management of UTIs in the Elderly
Acknowledgements

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Questions...

- Why is this important?
- How can we recognize UTI’s in the elderly?
- What are distractors and how can we deal with them?
- How do you collect a proper specimen and when to send?
- When should a UTI be treated?
- What information should we have before we contact the physician?
- How can we effectively control UTIs in our LTC homes?
UTIs are the most misdiagnosed infections in the elderly!

“Unnecessary use of antimicrobials in elderly people can lead to adverse consequences including the development of multi-drug antimicrobial resistance, drug-related adverse effects, harmful drug interactions, and excessive costs.”

Loeb et al, BMJ, doi:10.1136/bmj.38602.586343.55
Risk Factors in Elderly?

- The presence of comorbid conditions
- Presence of an indwelling catheter
- Neurogenic bladder caused by conditions such as stroke, Alzheimer’s disease or Parkinson’s disease,
- Dehydration
- Risk factors differ for males and females
- Hormonal changes
- Immune system changes

How do we recognize UTIs in the Elderly?

Urinary Tract Infections (UTIs) are the most common bacterial infection in the elderly

- 25% of all community acquired bacterial infections
- 30% of all bacterial infections in residents in LTC
- >30% of HAI’s reported by acute care hospitals

Alberta Clinical Practice Guidelines Program. Towards Optimum Practice, UTI in LTC. 2010
Challenges of Assessment in the Elderly

Diagnosis of infection can be difficult

- Elderly may not have a fever or chills
- May not have high WBC (leukocytosis) in their blood work
- Residents may have dementia and can’t express pain or discomfort verbally
- Residents may have an atypical presentation of acute illness
- Other **distractors** may be present
Distractors for UTIs

Asymptomatic UTI

- Fever alone
- Cloudy urine (Pyuria)
- Smelly urine
- Change in mental function alone
- Falls alone
- Family wants a sample sent

Change in function status alone

Dehydration

Family wants a sample sent
Atypical Presentation

Acute onset/change of geriatric symptom syndromes is a **RED FLAG**

- Falls
- Decline of mobility and function
- Incontinence
- Impaired cognition
Importance of Assessment

• Rule out other causes
  • New medication?
  • Change in diet?
  • Drinking enough? Dehydrated?
    • Encourage fluids (Minimum 1-1.5 L/Day)
  • Other infections?

• Take vital signs:
  • Fever? Change in BP, Pulse, RR?

• Physical assessment for UTI symptoms
Pressure from family to treat?

• Educate: Newsletter or One on One as it comes up
  • Risk of Morbidity and Mortality (Nicolle et al 2000):
    “The presence of asymptomatic bacteriuria has not been shown to be associated with adverse outcomes in long-term-care facility residents. There is no evidence for accelerated functional decline with asymptomatic bacteriuria or development or progression of renal failure.”

• Care conferences
• Physician involvement
• Case study example
Treatment of UTIs:

Asymptomatic vs Symptomatic
Asymptomatic Bacteriuria and distractors - Treat?

NO!

4 randomized control trials showed no benefit of treatment in institutionalized elderly people


“Recommendations are clear....routine screening and treatment are not recommended. There have been several studies showing no benefits associated with the treatment of asymptomatic infections as measured by the rate of subsequent symptomatic infections, improvement of chronic urinary symptoms or survival”

Alberta Clinical Practice Guidelines Program. Towards Optimum Practice, UTI in LTC. 2010
Bacteriuria = bacteria in the urine

Asymptomatic bacteriuria:

• Bacteriuria *without* apparent symptoms and,
• is defined for clinical purposes by the presence of $\geq 10^5$ cfu/mL of one or more organisms on two consecutive urine specimens and,
• absence of symptoms attributable to urinary infection.

Nicolle et al. ICHE 2001 Mar;22(3):167-75
Asymptomatic Bacteriuria Prevalence

Community:
- Women: 20%
- Men >75: 6-15%

LTC:
- Women: 25-50%
- Men: 15-40%

Chronic indwelling cath
- 100%

Foxman, B. Am J Med 2002; 113:5S-13S
Definitions

Pyuria = pus in the urine

- Over 90% of men or women with asymptomatic bacteriuria have associated pyuria
- 100% of symptomatic UTIs will have pyuria
- Pyuria does not differentiate asymptomatic from symptomatic
- Absence of pyuria is useful to exclude infection, but not to identify a UTI. Alone, it is not diagnostic

Pyuria **without** symptoms should **not** be treated.

Nicolle et al, CID 2005:40 (1 March)
Surveillance Definitions for UTI


Definition of UTI – LTC

Symptomatic urinary tract infection

Does **NOT have an indwelling urinary catheter** and has at **least three** of the following signs and symptoms:

- Fever (≥38°C) or chills,
- New or increased burning pain on urination, frequency or urgency,
- New flank or suprapubic pain or tenderness,
- Change in character of urine (e.g., new bloody urine, foul smell or amount of sediment or as reported by the laboratory (new pyuria or microscopic hematuria)
- Worsening of mental or functional status (may be new or increased incontinence)

### How do we recognize UTIs?

<table>
<thead>
<tr>
<th>Adults</th>
<th>Elderly</th>
<th>Paediatric (&lt; 1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fever &gt;38°C</td>
<td><strong>Add:</strong></td>
<td>• Fever &gt;38°C rectally</td>
</tr>
<tr>
<td>• Urgency</td>
<td>• Altered mental status</td>
<td>• Hypothermia &lt; 37 °C</td>
</tr>
<tr>
<td>• Frequency</td>
<td>• New incontinence</td>
<td>• Apnea</td>
</tr>
<tr>
<td>• Dysuria</td>
<td>• Nausea and vomiting</td>
<td>• Bradycardia</td>
</tr>
<tr>
<td>• Suprapubic tenderness</td>
<td>• Urinary retention</td>
<td>• Dysuria</td>
</tr>
<tr>
<td></td>
<td>• 30% may not have a fever</td>
<td>• Lethargy</td>
</tr>
</tbody>
</table>

Nicolle et al, CID 2000 31:757-761
When/Why do YOU send urine specimens?

• Routine?
• On admission?
• Annually?
• Other reasons?
Get rid of the dipstick test!

“In the absence of a minimum set of symptoms or signs of urinary tract infection, urine should not be cultured and antimicrobials should not be prescribed”


“Positive dipstick test for leukocyte esterase or nitrite is not diagnostic for a UTI”.

Alberta Clinical Practice Guidelines Program. Towards Optimum Practice, UTI in LTC. 2010
Fig 1
Diagnostic algorithm for ordering urine cultures for nursing home residents [in intervention arm]

Fever of >37.9°C (100°F) or 1.5°C (2.4°F) increase above baseline on at least two occasions over last 12 hours?

Yes

2 or more symptoms or signs of non-urinary tract infection*?

Yes

Do not order urine culture

Order urine culture for one or more of following:
- Dysuria
- Urinary catheter
- Urgency
- Flank pain
- Shaking chills
- Urinary incontinence
- Frequency
- Gross haematuria
- Suprapubic pain

No

Order urine culture for one or more of following:
- New costovertebral tenderness
- Rigors
- New onset of delirium

Urinary catheter?

Yes

Order urine culture for new onset burning urination or for two or more of following:
- Urgency
- Flank pain
- Shaking chills
- Urinary incontinence
- Frequency
- Gross haematuria
- Suprapubic pain

No

* Respiratory symptoms include increased shortness of breath, increased cough, increased sputum production, new pleuritic chest pain.
Gastrointestinal symptoms include nausea or vomiting, new abdominal pain, new onset of diarrhea
Skin and soft tissue symptoms include new redness, warmth, swelling, purulent drainage

Challenges of Specimen Collection

Procuring a good specimen can be difficult due to:

• Resident immobility
• Resident cognitive impairment
• Intrusion of “in and out” catheterization
• Incontinence
How do you collect a proper specimen?

**Urine Specimens (non-catheterized)**

- Ensure good local cleaning (peri-care)
- Obtain clean catch OR mid-stream OR
- In and out catheterization - women OR
- Condom catheter - men (freshly applied)
- Label appropriately and thoroughly – include **date and time**
- Refrigerate and/or send immediately

“The use of bedpans or pedibags for collection of urine specimens from women is associated with substantial contamination and cannot currently be recommended. “

Improving specimen collection

- Poster reminders and/or procedures
- Staff education
- Make it part of the paper work (how was the specimen collected?)
Urine Specimens – Handling and Transportation

Laboratory Recommendations

• Refrigerate at 4°C

• Transport to lab (by cooler bag) within 2 hours

• Sitting at room temperature, the bacteria will multiply over time

• If the lab sees more than 3 colonies, usual practice is not to process it further and request a repeat specimen
Consensus Guidelines re: Treatment of UTIs


*Infection Control & Hospital Epidemiology. 22(2):120-4, 2001 Feb.*


*BMJ, doi:10.1136/bmj.38602.586343.55*

- 2 algorithms:
  - When to order a urine culture
  - When to treat with antibiotics
Fig 2

Treatment algorithm for prescribing antimicrobials to nursing home residents in intervention arm

### Main Microbial Strains Responsible for UTIs

**Escherichia coli** – accounts for 40% of CAUTIs

**Klebsiella pneumoniae**

**Proteus mirabilis** and **Proteus vulgaris** and **Morganella morganii** – more common in men than women

**Proteus** - common in those who are chronically catheterized

**Gram negative organisms** – (other than *E. coli* are isolated more frequently and tend to be more resistant)

**Gram positive organisms** – including **Enterococci**, coagulase negative **Staphylococci** and group B **Streptococci** are frequently isolated

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*Alberta Clinical Practice Guidelines Program. Towards Optimum Practice, UTI in LTC. 2010*
Microbiology Results and Treatment

• Facility physician usually determines whether to treat

• What is a significant result?
  • Mixed flora – 50-100,000 + asymptomatic – don’t treat
  • $E. \text{coli} >10^5 + \text{symptoms} \rightarrow \text{treat}$
  • Mixed flora and symptomatic – maybe treat - empirical antibiotic therapy may potentially relieve symptoms of acute dysuria

• Remember to look at the sensitivity on lab results

• Check whether the organisms are susceptible to the antibiotic ordered
General Measures and Considerations

• Avoid catheters!
  • Consider residents on intermittent caths or condom caths in the same category as residents with no indwelling cath

• Nursing care:
  • Promote fluid intake (as tolerated) - urine won’t be concentrated and foul smelling. (Dehydration is a problem in LTC – but does not “cause” UTIs)
  • Maximize function and mobility
  • Toilet q 2-3 h during waking hours
  • Provide meticulous continence care, peri-care and catheter care
Other Issues and Common Questions in LTC

- Frequency of changing an indwelling catheter and catheter bags
- Changing from a catheter bag to a leg bag
- Clean technique vs sterile insertion of catheters
- Calling the doctor too soon without enough information
How do you manage catheters?

• Are there any in the home that are not necessary?
• Do you follow these Best Practices for managing catheters?
Changing Indwelling Catheters and Catheter Bags

• Do not change indwelling catheters or urinary drainage bags at arbitrary fixed intervals.

   APIC Infection Prevention Manual for LTC Facilities, 2009
   Note: (No HICPAC guideline regarding frequency of change)

• Keep system closed/Minimize unnecessary opening of the closed system


• Change based on clinical indications such as infection, obstruction or when the closed system is compromised

   Alberta Clinical Practice Guidelines Program. Towards Optimum Practice, UTI in LTC. 2010
“Change bags when the Foley catheter is changed and as needed because of accumulation of sediment, discolouration of the bag, odour, leakage, etc. When the bag is replaced, care should be taken to prevent contamination of the closed system”

APIC Infection Prevention Manual for LTC Facilities, 2009
Changing from catheter bag to leg bag

- Disconnection of the drainage system is a risk factor for bacteriuria

  HICPAC Guideline 2009

- Change from catheter bag to leg bag – nursing policy

  APIC Infection Prevention Manual for LTC Facilities, 2009
  (no recommendations for cleaning)

- If the drainage tubing becomes disconnected, do not touch the ends of the catheter or tubing. Wipe the ends of the catheter and tubing with an antiseptic solution before reconnecting them.

  APIC Infection Prevention Manual for LTC Facilities, 2009
General Measures and Considerations

• Cranberry juice
  • Studies show mixed results
  • One study showed a minimum of 300-400 mg twice daily in tablet form or 8-16 ounces >30% cranberry juice blend is needed for therapeutic effect

• Foul smelling or cloudy urine is not a valid reason to initiate antibiotics
What information should we have BEFORE we contact the physician?

Ensure you carry out an assessment first and look for:

- Symptoms of symptomatic UTI
- Rule out other causes
- Hydrate
- Vital signs
- Pain – suprapubic or flank
- New incontinence
- Behavioural change reasons
- Consider medical directives that follow the Loeb et al algorithms mentioned earlier
Summary of UTI and The Elderly

DON’Ts:

- Assuming a behavioural change (single symptom) is indicative of a UTI
- Treating asymptomatic bacteriuria or distractors
- Ordering antibiotics when microbiology culture reports show mixed flora (indicating a contaminated specimen)
- Using antibiotics if no infection is identified on C & S

- Using antibiotics ordered empirically when they shows resistance. Treat according to sensitivities
- Routine screening and treatment for asymptomatic bacteriuria in NH residents
- Repeating urine cultures after a course of antibiotics
Summary of UTI and The Elderly

DO’S

• Send specimens for symptomatic UTIs only
• Reserve antibiotic therapy for symptomatic UTIs based on sensitivity profile
• Focus on prevention and proper assessment as opposed to treatment
• Remember that antibiotic misuse can lead to unfavorable consequences such as antibiotic resistant organisms like MRSA, VRE and *C. difficile*
Be sure that you are headed in the right direction by using best practices and consensus-based guidelines.
References


http://www.topalbertadoctors.org/.../urinary_tract_infection_guideline.pdf


References


http://cid.oxfordjournals.org/content/31/3/757.full.pdf+html


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